US ERA ARCHIVE DOCUMENT

## Compost Infrastructure: A View From 30,000 Feet

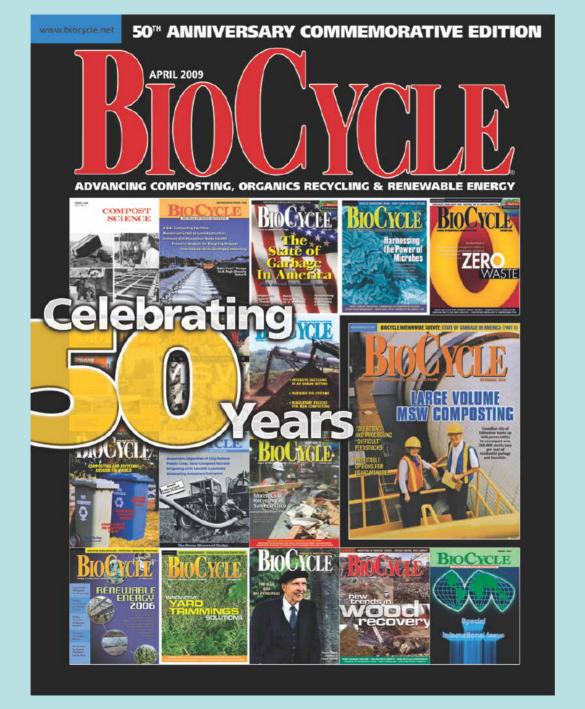
Nora Goldstein
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## How's The View?

- Very Clear (about what we need to do)
- A Bit Obstructed (on how we will get there)
- Pretty Hopeful (on the horizon)



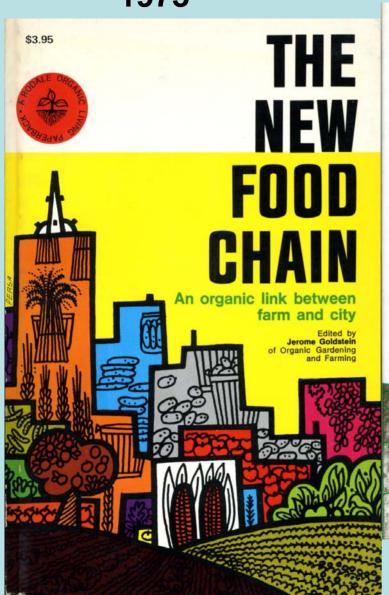


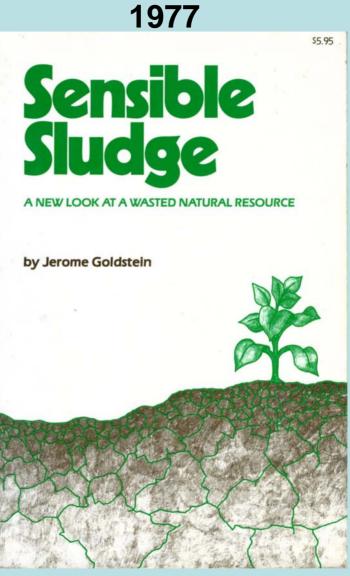
## COMPOST SCIENCE



"Boston Tee Perty"-1964 Style. New York Women Protest Incinerator Plan, Prefer Composting

1973



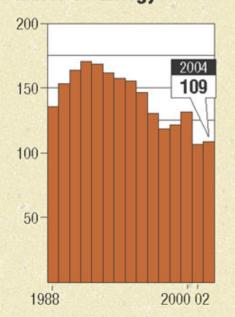


## Still About Natural Resources Conservation: World Economic Forum/Deloitte Report

- "Scarcity of natural resources will leave the consumer industry exposed to higher and more volatile pricing in little more than a decade"
- "Fundamental consumption imbalance with demand for natural resources outstripping supply"
- Companies need to shift towards a sustainable business model that is more efficient and less demanding of resources
- Traditional linear supply model build, buy, bury needs to be replaced with a model which enables resources to go full circle



## Landfills 10,000 8.000 6,000 2004 4.000 -1,654 2,000 -1988 2000 02 **Waste-To-Energy** 200



#### **MSW Landfills:**

1988: 8,000

2004: 1,654

2006: 1,831

BioCycle, 2006, The State of Garbage In America





## Yard Trimmings Composting Sites: 3,474 in U.S. (2004)

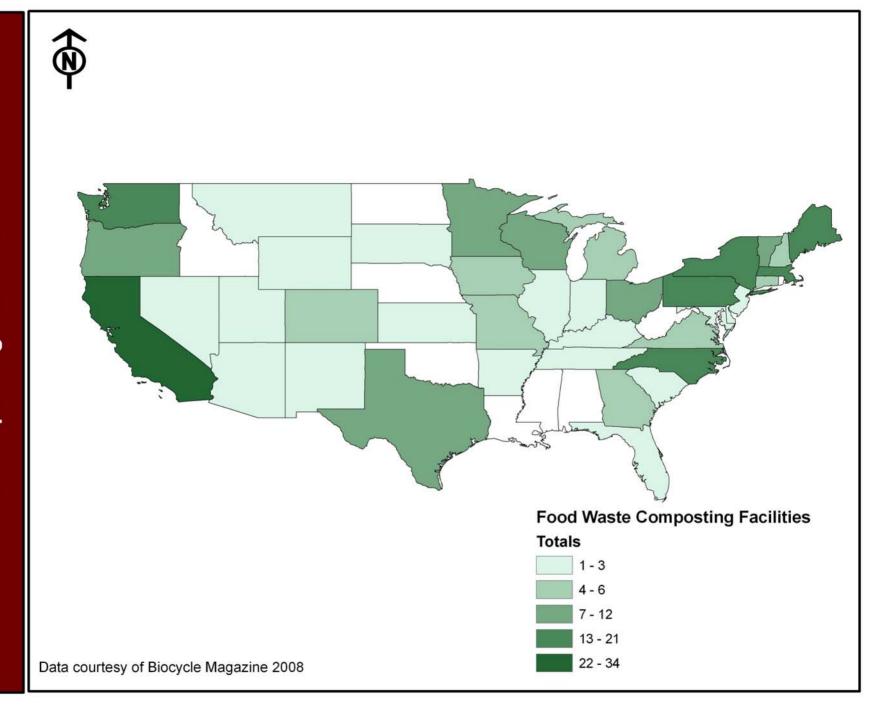
BioCycle, 2006, The State of Garbage In America



## BioCycle's 2008 Food Composting Infrastructure Survey

- Total of 267 food waste composting projects in U.S.
- Colleges/universities = 93
- Commercial composters = 92
- Farms = 43
- Municipalities = 39





# Give us 5 minutes.

# We'll put your compost site on the map.

Join BioCycle's www.findacomposter.com.

Your searchable data base of composting facilities in North America.

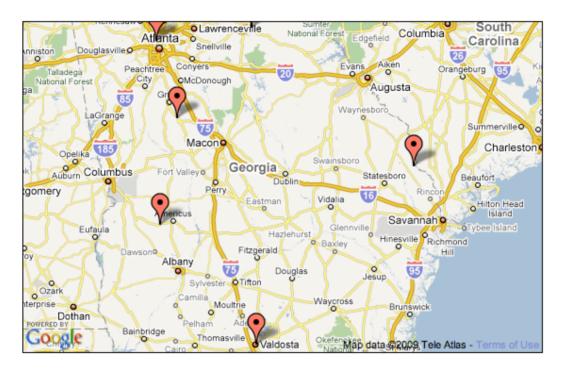
Get linked to organics generators and compost buyers today.

findacomposter.com





#### entries found.



Organization Name	City	State or Province	Postal/Zip code	URL of the organizations website
Back To The Garden Inc.	Athens	Georgia	30605	
City Of Valdosta Public Works	Valdosta	Georgia	31601	
Community Environmental Management Inc	Atlanta	Georgia	30327	
Erth Products, Llc	Plains	Georgia	31780	www.erthproducts.com
Greenco	Barnesville	Georgia	30204	www.greencoenvironmental.com
Longwood Plantation	Newington	Georgia	30446	www.longwood-plantation.com





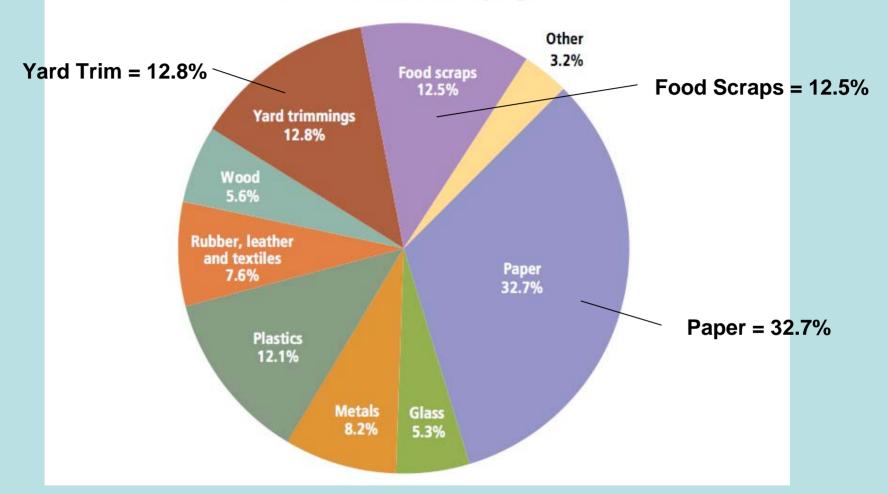


Composting Operation Description *  If you selected Other, please specify	Yard trimmings site that accepts food residuals
Facility Ownership If you selected Other, please specify	Municipally-owned 💠
Regulatory Status *	Solid waste facility permit Permitted to accept source separated preconsumer only Permitted to accept source separated preconsumer and postconsumer food residuals only Biosolids composting permit Permit by rule Agriculture exemption On-Site composting exemption Other
If you selected Other, please specify	
Agricultural	Cotton Crop fodder Crop residuals Feathers Hay Bales Manure - Aquaculture solids Manure - Dairy Manure - Horse Manure - Poultry Manure - Zoo animal Mortalities Mushroom waste/compost

Food	Bones Butcher residuals Coffee grounds Dairy Fats, Oils, Grease (FOG) Food processing wastes (commercial/industrial) Grocery store Liquids (not FOG) Municipal Solid Waste (mixed) Postconsumer Preconsumer - Non-Vegatative Preconsumer - Vegetative only Residential food waste Seafood Special Events Vegetable Oil
Paper And Compostable Products	Compostable bags Compostable serviceware Food soiled paper Mixed paper Office paper Papermill waste Un-waxed cardboard Waxed cardboard
Yard trimmings And Wood Waste	Branches Brush Construction & Demolition Forestry slash Grass Greenhouse debris Land clearing debris Leaves Logs Sawdust Stumps Three dimensional lumber

QuickTime™ and a TIFF (Uncompressed) decompressor are needed to see this picture.

Figure 5. Total MSW Generation (by material), 2007 254 Million Tons (before recycling)



	Weight generated	Weight discarded	Recov. as % of generation	
Other wastes				
Food, other‡	31.7	0.81	2.6%	
Yard trimmings	32.6	20.9	64.1%	

Table 1. State of Garbage in America survey data 1989–2006: Reported and estimated MSW generation and rates of MSW recycling, waste-to-energy and landfilling<sup>1</sup>

Year Of Data	Reported MSW Generation <sup>2</sup> (tons/yr)	Estimated MSW Generated <sup>3</sup> (tons/yr)	MSW Recycled⁴ (%)	MSW Waste-To-Energy (%)	MSW Landfilled (%)
1989	269,000,000		8.0	8.0	84.0
1990	293,613,000		11.5	11.5	77.0
1991	280,675,000		14.0	10.0	76.0
1992	291,472,000		17.0	11.0	72.0
1993	306,866,000		19.0	10.0	71.0
1994	322,879,000		23.0	10.0	67.0
1995	326,709,000		27.0	10.0	63.0
1996	327,460,000		28.0	10.0	62.0
1997	340,466,000		30.0	9.0	61.0
1998	374,631,000		31.5	7.5	61.0
1999	382,594,000		33.0	7.0	60.0
2000	409,029,000		32.0	7.0	61.0
2002		369,381,411	26.7	7.7	65.6
2004		387,855,461	28.5	7.4	64.1
2006	-	413,014,732	28.6	6.9	64.5

<sup>1</sup>2002, 2004 and 2006 estimated MSW Generated, MSW Recycled, WTE and Landfilled have been adjusted to exclude non-MSW. <sup>2</sup>Reported MSW Generation is reported values calculated by BioCycle prior to collaboration with Columbia University and use of current methodology. <sup>3</sup>Estimated MSW Generated is sum of MSW Recycled, WTE and Landfilled. 4: MSW Recycled includes composting and recycling.

## **Materials Currently Disposed**

**August 2005 Waste characterization study** 

Blue and green areas compatible with existing Fan 3 system



#### **One Million-Plus Households Serviced**



Norseman
Green Bin —
Food waste only



## True Costs Associated with Managing Organic Waste in Region of Niagara, Ontario, Canada (Cdn\$\$/metric ton)

	Compost Green Waste only	Compost Food Waste	Landfill Gas Recovery Flare	LGR Elec.	EFW Low	EFW High	EFW Best case
Operations Cost/ton	33.83	81.77	82.93	69.00	102.00	168.00	88.00
Environ. Benefit/ Ton	49.59	49.59	7.79	19.63	25.28	25.28	25.28
True Cost/ton	(15.76)	32.18	75.14	49.37	76.72	142.72	62.72

http://www.regional.niagara.on.ca/news/2008/pdf/jan21Study.pdf



## Pythium root rot on creeping bentgrass

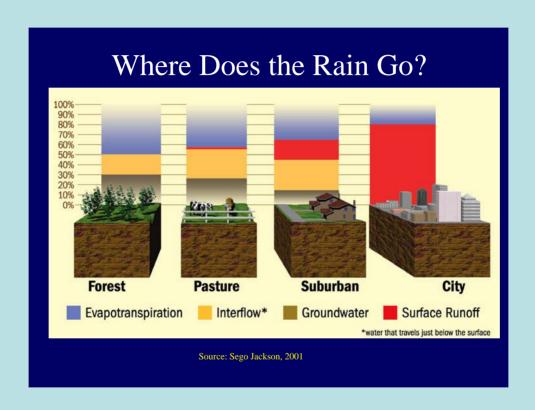


No compost



With 20% compost





#### **The Storm Water Challenge**

IN THE GARDEN

#### The Grass Is Greener at Harvard



Jodi Hilton for The New York Times

Eric T. Fleisher holding a core sample from the organic lawn at Harvard University.

By ANNE RAVER Published: September 23, 2009



## THE SUSTAINABLE SITES INITIATIVE



www.sustainablesites.org

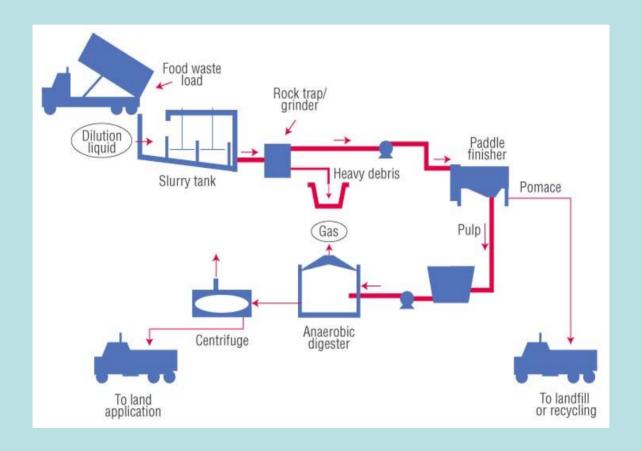




## Combined Sewer Overflows



## Schematic of EBMUD Food Waste Recycling Process at Wastewater Treatment Plant Anaerobic Digester



Patent Pending





#### Pulp extruded from slurry





Fepro Farms Cobden, Ontario



# September 2009 USEPA Report: Reducing GHG Emissions via Materials & Land Management Practices

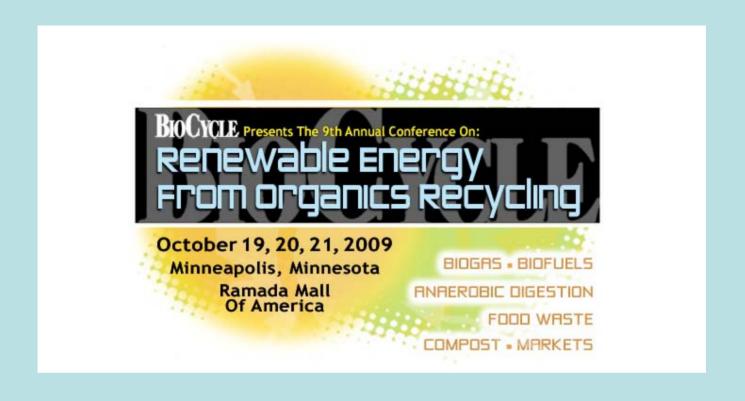
- Looks at "Total Technical Potential" GHG emission reduction if scenarios presented are achieved
- TTP scenarios include Source Reduction, Reuse/Recycling and Energy Recovery/Disposal
- At 50% rate, C&D, recycling/composting, and food scrap composting result in emissions reduction benefit of 155 MMTCO2e/yr
- Combust 50% of MSW landfilled is 35-60
- Increase methane capture to 50% is 70



## **30,000 Foot View**

- The People's Will
- Compost infrastructure is key part of sustainable local utilities and services
- Concentric Circle Infrastructure
- Appropriate Technologies
- Managing Risk
- Regulator Comfort Zones
- Carbon for Composting
- Creating and Sustaining The Behavior





www.biocycleenergy.com

### **Questions?**

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